Orchiectomy for acute testicular torsion


ABSTRACT

Introduction: Testicular torsion is a potentially disastrous condition if it is not corrected within a reasonably short period of time. The strategy that prevents gonadal loss is immediate exploration of the affected inguinal canal.

Materials and methods: A retrospective study of case records from the years 2004-2008 of children with testicular torsion is presented.

Results: From a total of 46 cases, 27 cases were children between 8 and 12 years of age. Only 4 children had a progression of 12 hours or less and there was intravaginal torsion in 43 cases. The left side was affected in 32 patients and out of the total of 46 patients, 43 patients required orchiectomy. Chi-square test indicated there was no association between scrotal coloration and testicular damage.

Conclusions: Early diagnosis is the most important factor with respect to whether or not the gonad will need to be removed.

Key words: testicle, testicular torsion, acute scrotal syndrome, orchiectomy.

Resumen

Introducción: la torsión testicular es una complicación potencialmente desastrosa si no se corrige dentro de un tiempo breve y la estrategia que evita la pérdida de la gonada es la exploración quirúrgica inmediata del canal inguinal afectado.

Material y métodos: estudio retrospectivo de los expedientes de los niños que sufrieron torsión testicular en el periodo comprendido entre los años 2004 y 2008.

Resultados: de un total de 46 casos, predominó entre los 8 y 12 años de edad con 27 casos; sólo cuatro niños tuvieron 12 horas o menos de evolución y en 43 la torsión fue intravaginal. El lado izquierdo fue el más afectado con 32 casos y del total, 43 requirieron orquiectomía. La X² sugiere que no existe asociación entre el color del escroto y el daño del testículo subyacente.

Conclusiones: Se insiste en que el diagnóstico temprano es el factor que más incide en la necesidad de extirpar la gonada.

Palabras clave: testículo, torsión testicular, síndrome escrotal agudo, orquiectomía, México.


**INTRODUCTION**

The condition in which the aspect of the scrotum changes, is accompanied by pain and usually requires surgical intervention in order to be resolved is generically described as acute scrotal syndrome. It also includes complications such as soft tissue and paratesticular structure infection as a consequence of persistent peritoneovaginal duct associated with peritonitis. The cause can be torsion of some of the appendages that hang from the testes and epididymis, strangulated inguinal hernia and less frequently orchitis, scrotal/testicular trauma, idiopathic scrotal edema, erysipelas and pyocele, hydrocele, epididymitis and testicular tumor.

With the exception of torsion, none of the diseases mentioned causes ischemia or gonadal loss from necrosis as a consequence of arterial circulation interruption and complication identification and surgical exploration of the affected inguinal tract is not so urgent.

Previous reports have insisted that one of the pending issues to be resolved is complication identification, surgical exploration of the affected inguinal tract is not so urgent.

The motivation behind sharing the authors’ experience is to create the necessity of opportune diagnosis through the proposition of a theoretical rapid decision model based on clinical findings gathered during physical examination and to find out through adequate statistical analyses which variables influence the development of testicular necrosis and the need to perform orchiectomy.

**MATERIALS AND METHODS**

Case records labeled as acute scrotal syndrome from the years 2004-2008 were analyzed and only cases diagnosed as testicular torsion were included in the study. The following variables were evaluated: age, duration of progression, absence or presence of cremasteric reflex, affected side, severity of ischemia, number of twists, direction of twists and procedure carried out. Range, mean and percentages were used to evaluate the variables. In relation to inferential statistical analysis the SPSS-15.0 statistical program was employed and the chi-square test, Pearson correlation and Student t test were applied.

**RESULTS**

From a total of 56 testicular torsion case records, only 46 were complete. Age varied from 6 months to 15 years with a mean age of 9.8 years. Groups were distributed by age as follows: 3 patients under 1 year of age (6.5%); 8 patients between 2-7 years (17.4%); 27 patients between 8-12 years (58.7%) and 8 patients between 13-15 years (17.4%). Cryptorchidism, testicular trauma, orchepididymitis and inguinal hernia were the associated conditions or those that appeared as conditioning or previous events (8.6%). In regard to clinical manifestations, all patients presented with pain and volume increase in the affected testis. Eight patients presented with phlogosis and edema (17.3%). Three patients presented with vomiting (6.5%) and two with fever (4.3%). The cremasteric reflex was absent in all cases. The left side was affected in 32 cases (69.5%) and there was clock-wise twist in 34 cases (73.9%). There was 1 twist in 32 children (69.5%), 2 twists in 10 children (21.7%) and 3 or more in the remaining children (8.8%) resulting in a mean 2.5 twists. Torsion was intravaginal in 43 cases (93.4%) (Image 1). One hundred percent of cases presented with serious ischemia but it was reversible in 3 cases. There was necrosis (Image 2) in the remaining 43 patients requiring orchiopexy (93.4%). Contralateral orchidopexy was carried out in all patients.

Regarding statistical test results, the comparison with the chi-square test to find out if change in scrotal coloration was related to the surgical aspect of the testes produced a P<0.001, meaning that changes in scrotal coloration did not translate into testicular damage (Table 1).

In the way, upon applying the Student t test in the age/time variables from disease onset to the carrying out of definitive therapeutic measures, it was observed that patients over 10 years of age had a longer progression with a P<0.001 and in regard to the affected side/progression duration variable, those who had left-side torsion tolerated it better than those with right-side torsion with a P<0.04.

There was no correlation in any of the tests (Pearson or Spearman) between testicular damage and progression duration, number of twists of the testis or leukocyte figures.

**DISCUSSION**

Although testicular torsion is a relatively frequent event, little has been studied about its etiopathology and effects, and the accepted explanation of it has been very rudimentary. The description of this phenomenon has been limited to mentioning that the mechanical blocking of arterial circulation leads to irreversible ischemia, depending on the number of twists and the time lapse...
 involved. However, the new conceptualization of the condition, without being contradictory, is based on recent observations when monitoring intratesticular pressure during surgical intervention in patients presenting with this complication. Since pressures were elevated the authors formulated a different thesis. They showed that intratesticular hypertension causes there to be an increase in venous flow that predisposes arterial circulation obstruction and the induction of ischemia-reperfusion injury. Therefore, during the phenomenon, in the interior of the testicular endothelial cells, signaling that triggers the intracellular cascade is speeded up, resulting in an increase in the production of toxic oxygenated radicals that eventually leads to germ cell apoptosis.

Testicular torsion was originally described by Hunter in 1776. However, credit was given to Delasiauve, a French psychiatrist, who published his monograph in 1840. Now nearly 180 years from that publication, testicular torsion continues to be a disease that is difficult to diagnose and its identification is usually delayed, leading to an elevated percentage of loss of the affected testis.

This complication appears in all races, at all ages and its frequency is not dependent on any particular climate. There is 1 case out of every four thousand individuals 25-years-old or younger which is the equivalent of a third of the total number of boys presenting with acute scrotal syndrome. Other authors have reported the figures of 1 out of every 160 males under 25 years of age. Testicular torsion is more common in children but it can also present during the last stages of life.

From an anatomical point of view, torsion can be total or in segments and can be divided clinically into acute or intermediate, intravaginal and extravaginal. Of these last two types intravaginal is more common in older boys and extravaginal is almost exclusive to newborns. Obviously, the acute unilateral form is more common but there have been sporadic cases of

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**Table 1. Relation of scrotal skin color change with underlying testis**

<table>
<thead>
<tr>
<th>Coloration change</th>
<th>Testicular aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square test</td>
<td>20.445</td>
</tr>
<tr>
<td>Degree of freedom</td>
<td>1</td>
</tr>
<tr>
<td>Asymptomatology</td>
<td>$p&lt;0.001$</td>
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<td>$p&lt;0.001$</td>
<td>$p&lt;0.001$</td>
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synchronous or asynchronous bilateral torsion and the type that twist and untwist spontaneously leading to what is known as testicular torsion and detorsion syndrome.13

Symptomatology is variable but pain is almost always present. In regard to diagnosis, some of the testes with this complication have a malformation called the “bell clapper” in which the tunica vaginalis is adhered to a high section of the cord and the gonad can remain horizontally suspended when hanging from the epididymis by way of a very long mesorchium.15,16,13 Thus the support base is very small and more susceptible to becoming twisted, as shown in the diagram (Image 3).

Children with this pathology complain of sudden pain followed by nausea, vomiting and slight fever. Physical examination reveals the affected testis to be in the transverse upper plane position with rotation and located anterior to the epididymis. When ipsilateral cremasteric reflex loss is also present, some authors are almost completely certain that these are cases of acute testicular torsion (Image 4).4,17 In contrast, in the intermittent type pain is usually gradual and is frequently associated with fever, leukocytosis and pyuria. Mobility in this type of torsion is illustrated by the following anecdote of a physician who had the pathology. Every time he felt pain he turned his testis three and a half times from left to right and the discomfort disappeared.13

In relation to the same topic, Ciftci et al. 18 appear to be contradictory when they state that “sudden severe pain and absence of previous attacks are characteristic of testicular torsion” and “the presence of nausea and vomiting should be suggestive of testicular torsion to the surgeon, but the absence of those symptoms does not exclude surgical intervention, if it is clinically indicated”. But, as if that were not enough, they state that Prehn’s sign and the absence of the cremasteric reflex, both able to help differentiate epididymitis from torsion, are very unspecific and should not be given too much importance.7,18

Being that clinical diagnosis is so difficult, Doppler ultrasound has become invaluable useful. When intratesticular flow is visualized without difficulty in the normal testis but is absent or very reduced on the affected side, diagnosis is confirmed.20 According to the literature scintigraphy and dynamic contrast-enhanced subtraction nuclear magnetic resonance21 are of extraordinary usefulness but they have the disadvantage of reduced availability and high performance cost.

Regarding correction, this complication is a surgical emergency due to the high risk of gonadal necrosis (Image 4) the longer progression continues.

Recent national publications22 state that 87.1% of cases require orchiectomy. When added to the 93.4% of the group of cases described here, that translates into the necessity of immediate surgical exploration of the inguinal canal. External detorsion with or without ultrasound has been proposed as an alternative option 23 and it is usually effective in adults due to the fact that the organ is considerably larger than in the child.

Surgical intervention consists of direct vision of the affected testis, turning it to its normal position and keeping it in place. Once the adequate amount of time has passed a small incision should be made over the albuginea. If there is hemorrhage, even if it is venous, the gonad should be left in place, but if no blood flows it should be removed. The contralateral testis should be secured to the scrotum at the risk of the rarely seen asynchronous bilateral torsion.

Despite the fact that some authors have found testicular viability even 48 hours after torsion,20 recent and past22 series of the authors of this review establish an alarming necrosis percentage.

Finally, despite the statistical result, the impression is that the most influential factor in gonadal gangrene is the delay in disease identification and inadequately timed surgical intervention.10 Therefore the authors wish to reiterate that every patient school-age or older who complains of testicular pain and whose gonad has the above-mentioned characteristics should be surgically
examined under the guidance of the annexed flow diagram (Image 5), except when there is clear categorical evidence that the pathology is not torsion. It should be taken into consideration that units such as the authors’ are Level II hospital units and are not equipped with Doppler ultrasound but, paradoxically, receive this type of patient. And in contrast, the Level III institutions that have the necessary equipment rarely treat this type of patient.

For many years it has been suggested that torsion causes autosensitivity that can have an influence on fertilization capacity. This theory has not been proved or disproved.

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